Remarks/Arguments

Amendments to the Claims

Applicants have amended Claim 11 to fix a minor grammatical error. Applicants submit that no new matter has been entered by this amendment.

The Allowance of Claims 1 and 3-10

The Primary Examiner has acknowledged that Claims 1 and 3-10 are allowed. Applicants graciously thank the Primary Examiner for the allowance of Claims 1 and 3-10.

The Rejection of Claim 11 under 35 U.S.C. §103(a)

Applicants spoke with Examiner Leykin via telephone regarding the July 24, 2007 Office Action on July 30, 2007 in which Examiner Leykin confirmed that Claim 11 was rejected under 35 U.S.C. §103(a) and not under 35 U.S.C. §102(b) as set forth in the Official Action of July 24, 2007. Accordingly, applicants arguments are directed to a rejection under 35 U.S.C. §103(a) based upon U.S. Patent No. 5,315,218 in view of U.S. Patent No. 6,307,337.

The Primary Examiner has rejected Claim 11 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,315,218 (*Fortune et al.*) in view of U.S. Patent No. 6,307,337 (*Nelson*). Applicants respectfully traverse the rejection. *Fortune et al.* describe current conducting switches that energize electric motors. By knowing which switches are closed and which switches are open, one knows which motor is energized. However, *Fortune et al.* fail to disclose a Hall Effect sensor or at least one means for validating the direction of movement of the motor. *Nelson* describes a brushless DC motor assembly which uses Hall Effect sensors to

determine rotational position. However, *Nelson* fails to describe at least one means for validating the direction of movement of the motor as recited in amended Claim 11. Currently amended Claim 11 recites (emphasis added):

> A shift motor of a transmission actuator comprising **at least one means for validating the direction of movement of the motor**, wherein said means measures a detected signal current flow, and wherein said means further comprises at least one Hall sensor.

Neither *Fortune et al.* nor *Nelson* describe at least one means for validating the direction of movement of the motor and therefore the combination of *Fortune et al.* and *Nelson* fails to make out a *prima facie* case of obviousness under 35 U.S.C. §103(a) to reject amended Claim 11. As you know, "the prior art reference (or references) when combined must teach or suggest all the claim limitations." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). *Fortune et al.* merely describes a method of switching the direction of current flow to an electric motor by using a set of switches, one of which is rapidly pulsed between conducting and non-conducting states. (Col. 6, Lines 1-29). *Nelson* merely describes a brushless DC motor assembly having Hall Effect sensors which are only used to determine the position of the motor's rotor.

In particular, *Nelson* describes only two Hall Effect sensors which are located adjacent the rotor and 180 degrees apart from each other. (Col. 9, Lines 3-6). In operation, Hall Effect sensors only generate an output pulse when the rotor passes the sensor. *Nelson* further describes the operation of the Hall Effect sensors as being individually active at one time, meaning that only a single Hall Effect Sensor can be active at one time. Nevertheless, the sensors can both be

inactive at the same time. (Col. 9, Lines 5-6). Since there are only two sensors, the sensors will be active once each at, the point in time when the rotor passes the sensor.

In view of the fact that Nelson discloses that there are only two Hall Effect sensors placed 180 degrees apart, a single revolution **in either direction** yields an output from each sensor at equal intervals. Since the output intervals between the sensors are equal, it is not possible to determine which direction the rotor is turning. Although the position of the rotor when it passes the Hall Effect sensors is obtainable, the direction of movement of the rotor is not obtainable due to the 180 degree arrangement of *Nelson*. In other words, the combination of *Fortune et al.* and *Nelson* fails to describe at least one means for validating the direction of movement of the motor with a Hall Effect sensor as recited in amended Claim 11.

For example, the interval between outputs of the Hall Effect sensors in a first direction is directly proportional to the rotational speed of the motor in the first direction and rotational distance between the Hall Effect sensors. In the second direction, the interval between outputs of the Hall Effect sensors will again be directly proportional to the rotational speed of the motor and the rotational distance between the Hall Effect sensors. Since the rotational speed is the same for both directions and the rotational distance is the same for both direction (180 degrees apart as required by *Nelson*), the interval between outputs of the Hall Effect sensors will be exactly the same in both the first direction and the second direction. Therefore, the position of the rotor is detected twice in one revolution and it is impossible to detect the direction of rotation based upon the Hall Effect sensors of *Nelson*. Not only does *Nelson* fail to disclose at least one means for validating the direction of movement of the motor with a Hall Effect sensor, the *Nelson*

arrangement specifically teaches away from providing at least one means for validating the direction of movement of the motor.

In summary, the combination of *Fortune et al.* and *Nelson* fails to render Claim 11 unpatentable because *Nelson* fails to cure the defects of *Fortune et al.* Namely, *Nelson* fails, as well as *Fortune et al.*, to teach or suggest a means for validating the direction of movement of the motor.

Conclusion

Applicants respectfully submit that all pending claims are now in condition for allowance, which action is courteously requested.

Respectfully submitted,

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